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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,217	07/18/2003	Khawar M. Zuberi	M1103.70194US00	4643
45840 7590 06/04/2007 WOLF GREENFIELD (Microsoft Corporation) C/O WOLF, GREENFIELD & SACKS, P.C. 600 ATLANTIC AVENUE BOSTON, MA 02210-2206			EXAMINER SURVILLO, OLEG	
			ART UNIT 2142	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/622,217	ZUBERI, KHAWAR M.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Oleg Survillo	2142	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 March 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2003 and 16 March 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

Art Unit: 2142

### **DETAILED ACTION**

This Office Action is responsive to Reply filed on March 16, 2007.

#### ***Response to Amendment***

1. This Action is responsive to the amendment filed on March 16, 2007. Claims 1-28 remain in the application. Claims 1, 8, 15, and 22 are amended herein. There are no newly added claims.

#### ***Response to Arguments***

2. With regard to the Applicant's remarks filed on March 16, 2007:

Regarding the objections to the drawings and the objections to the specification, Applicant's amendments have been considered and are deemed sufficient.

Therefore, said objections have been withdrawn. However, upon further consideration, new grounds of objections are made.

Regarding the rejection of the claims 1, 4-7, 15, and 18-21 as being anticipated by Boyd et al. (Patent No.: 6,721,806), the arguments have been considered, but are not deemed persuasive. In particular, Applicant's arguments with respect to 35 U.S.C. 102 rejection of claims 1, 4-7, 15, 18-21 appear to be a general allegation of patentability, which is not in accord with 37 C.F.R. 1.111(b), which states that:

*In order to be entitled to reconsideration or further examination, the applicant or patent owner must reply to the Office action. The reply by the applicant or patent owner must be reduced to a writing which distinctly and specifically points out the supposed*

Art Unit: 2142

*errors in the examiner's action and must reply to every ground of objection and rejection in the prior Office action. The reply must present arguments pointing out the specific distinctions believed to render the claims, including any newly presented claims, patentable over any applied references. If the reply is with respect to an application, a request may be made that objections or requirements as to form not necessary to further consideration of the claims be held in abeyance until allowable subject matter is indicated. The applicant's or patent owner's reply must appear throughout to be a bona fide attempt to advance the application or the reexamination proceeding to final action. A general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references does not comply with the requirements of this section.*

In addition, Applicant appears to allege that: "claim 8 patentably distinguishes over Boyd and that claims 9-14 depend from claim 8 and are allowable for at least the same reasons" wherein claims 8-14 were rejected in the Office Action mailed December 18, 2006 under 35 U.S.C. 103(a) as being unpatentable over Boyd in view of the Internet Draft document "RDMA Protocol Verbs Specification" by Jeff Hilland.

Regarding the rejection of the claims 2-3, 8-14, 16-17, and 22-28 as being unpatentable over Boyd et al. (Patent No.: 6,721,806) in view of the Internet Draft document "RDMA Protocol Verbs Specification" by Jeff Hilland, the arguments have been considered, but are not deemed persuasive. In particular, Applicant's arguments with respect to 35 U.S.C. 102(e) rejection of claims 1, 4-7, 15, 18-21 appear to be a

general allegation of patentability, which is not in accord with 37 C.F.R. 1.111(b), as previously noted.

Thus, Applicant's arguments can not be held as persuasive regarding patentability of claims 1-28 and said rejections have been maintained.

### ***Specification***

1. The disclosure is objected to because of the following informalities: Fig. 1 was amended to include Output Device(s) (116) and Input Device(s) (114). However, paragraph [0024] of the amended specification still refers to keyboard (162), mouse (161), which are all input devices, but are grouped under the reference number (114) as shown in Fig. 1. Similarly, output devices such as display (191), speakers (196), and printer (196) are grouped under the reference number (116) as shown in Fig. 1.

Applicant is advised to amend the paragraph [0024] of the specification in such a way that reference numbers shown in Fig. 1 are consistent with the reference numbers used in the specification, complying with 37 CFR 1.84(p)(5).

2. The disclosure is objected to because of the following informalities: newly added paragraph [0037] refers to computer (503) on line 2 wherein it appears that it should refer to computer (501) as shown in Fig. 5. Also, in the same paragraph step (622) on line 12 is referring to the function performed by step (624) as shown in Fig. 6a wherein remote computer (515) sends TCP/IP datagram (609) to computer (501) over the Internet (513). In addition, the disclosure does not provide a disclosure of step (622) shown in Fig. 6a.

Art Unit: 2142

Appropriate correction is required.

3. The amendment filed on March 16, 2007 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material, which is not supported by the original disclosure, is as follows:

In the Office action mailed on December 18, 2006, Examiner made an objection to the Specification citing the reference named "RDMA Protocol Verbs Specification" that teaches away from the subject matter in the disclosure of the current application with regards to the process of generating the STags. In response to the objection raised by the Examiner, Applicant amended the specification and appended claims from claiming that NIC in the first machine generates the STag and then sends it to a remote computer to claiming that NIC in the first machine only utilizes the STag by sending it to a remote computer. Applicant did not provide any arguments traversing the validity of the raised objection. The recited amendment is believed to introduce new matter into the disclosure because the original disclosure incorporates the embodiments directed to methods that overcome the problem of a STag arriving at a network interface that did not generate the STag (paragraph [0007]) wherein the amended disclosure states that a network interface does not perform the step of generating the STag, but instead performs the step of sending the STag. It is not clear if the problem of a STag arriving at a network interface that did not generate the STag still exists when a network interface does not generate the STag as presently claimed in the appended claims.

Art Unit: 2142

Applicant is required to cancel the new matter in the reply to this Office Action or provide sufficient arguments explaining why the problem of a STag arriving at a network interface that did not send the STag would still exist.

### ***Claim Objections***

4. Claim 1 is objected to because of the following informalities: the step of receiving a message from the second network interface is ambiguous. As amended, the step recites the message indicating the reception of the identifier **by** (emphasis added) the second device. It is not clear why the step of receiving a message from the second network interface was amended to have the message indicating the reception of the identifier **by** the second device, wherein it is believed that the message indicating the reception of the identifier **from** the second device, as originally claimed, was proper. Appropriate corrections or arguments regarding the amended step are required.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.



Art Unit: 2142

2. Claims 1, 4-7, 15, 18-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Boyd et al. (6,721,806).

As to claim 1, Boyd shows a method for transferring control comprising switchover between a first network interface and at least a second network interface comprising IPSOE (118) and (120) in a multiple network interface device comprising a host processor node (102) all in Fig. 1, where IPSOE is used to interface to IP net (100) (col. 5, line 38), after the first network interface sends an identifier comprising a send work queue (402) wherein each of the send work request's data segments contains part of a virtually contiguous memory region (col. 8, lines 38-48) specified by DDP/RDMA header (622), the identifier associated with a memory location in the multiple network interface device comprising DDP/RDMA header (622) that specifies the message identifier and the placement information for the data payload (col. 11, lines 10-14), to a second device comprising host processor node (704) in Fig. 7, the identifier and an associated data field capable of being received by the second network interface (col. 11, lines 36-55).

Boyd shows receiving a message from the second network interface by a program component, the message indicating the reception of the identifier and the associated data field from the second device comprising receive work queue (400) containing work queue elements (WQEs) (416-420), describing where to place incoming channel semantic data from the IP net fabric (col. 8, lines 16-22) wherein a program component comprising a message and data service (224) receives and processes



Art Unit: 2142

messages from the second network interface comprising IPSOE (212) (col. 7, lines 11-23).

Boyd shows passing the identifier to the program component comprising having a message and data service (224) that receives and processes messages and data received through the second network interface (col. 7, lines 11-23) wherein a message is comprising a message identifier (col. 10 lines 58-67 and col. 11 lines 1-14).

Boyd shows querying the first network interface to supply the program component with a list of identifiers comprising the range of QP numbers, CQ numbers, and the range of Memory Translation and Protection Table (col. 21, lines 20-24) which provide a list of identifiers and associated memory locations (col. 7, lines 39-44; col. 16, lines 1-40), sent by the first network interface and associated memory locations in multiple network interface device memory (col. 21 lines 6-12) wherein the host comprises the program component (col. 7 lines 17-24).

Boyd shows identifying, by the program component, that the first network interface sent the identifier comprising having RNIC Identification context information (1240) as a part of QP (1172) that uniquely identifies RNIC, which sent/received a message comprising the identifier (col. 16 lines 24-28 and col. 19 lines 1-10).

Boyd also shows transmitting a memory location associated with the identifier to the second network interface comprising sharing QP, CQ, and Memory TPT range between primary and alternate RNICs (col. 14 lines 22-67 and col. 15 lines 1-55), wherein the second network interface is capable of transmitting the associated data field

Art Unit: 2142

to the memory location associated with the identifier comprising switching all outstanding connections to an alternate RNIC (col. 2, lines 59-61 and col. 21 lines 13-19).

As to claim 4, Boyd shows a computer readable media comprising a memory location to be a random access memory (col. 35, line 3).

As to claim 5, Boyd shows a program component being a computer operating system (col. 7, lines 14-17).

As to claim 6, Boyd shows the first and second network interfaces operating under RDMA protocol (col. 2, lines 55-57).

As to claim 7, Boyd shows the first and second network interfaces operating under RDMA protocol over TCP/IP protocol (col. 2, lines 33-35).

As to claim 15, Boyd shows instructions stored on a computer readable medium (col. 35, lines 1-5) performing the recited steps of claim 1.

As to claims 18-21, Boyd shows instructions stored on a computer readable medium (col. 35, lines 1-5) performing the recited steps of claim 1 and further showing the additionally recited elements, as discussed regarding claims 4-7.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 2142

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-3, 8-14, 16-17, 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd et al. (6,721,806) in view of the Internet Draft document "RDMA Protocol Verbs Specification" by Jeff Hilland.

As to claim 8, Boyd shows a method for transferring control comprising switchover between a first network interface and at least a second network interface comprising IPSOE (118) and (120) in a host computer including the first network interface and the second network interface comprising a host processor node (102) all in Fig. 1, where IPSOE is used to interface to IP net (100) (col. 5, line 38).

Boyd shows receiving an identifier from a remote computer by the at least a second network interface, the identifier sent by the first network interface and associated with a memory location in the host computer comprising receive work queue (400) containing work queue elements (WQEs) (416-420), describing where to place incoming channel semantic data from the IP net fabric (col. 8, lines 16-22) wherein a program component comprising a message and data service (224) receives and processes messages from the second network interface comprising IPSOE (212) (col. 7, lines 11-23) and wherein the first network interface sends an identifier comprising a send work queue (402) wherein each of the send work request's data segments contains part of a virtually contiguous memory region (col. 8, lines 38-48) specified by DDP/RDMA header (622), the identifier associated with a memory location in the multiple network interface device comprising DDP/RDMA header (622) that specifies

Art Unit: 2142

the message identifier and the placement information for the data payload (col. 11, lines 10-14).

Boyd shows sending a message to a program component indicating the reception of the identifier comprising having a message and data service (224) that receives and processes messages and data received through the second network interface (col. 7, lines 11-23) wherein a message is comprising a message identifier (col. 10 lines 58-67 and col. 11 lines 1-14), the program component configured to query the first network interface for a list of identifiers sent by the first network interface and associated memory locations in the host computer comprising querying the first network interface for the range of QP numbers, CQ numbers, and the range of Memory Translation and Protection Table (col. 21, lines 20-24) which provide a list of identifiers and associated memory locations (col. 7, lines 39-44; col. 16, lines 1-40), sent by the first network interface and associated memory locations in the host computer (col. 21 lines 6-12).

Boyd shows passing the identifier received from the remote computer to the program component comprising having a message and data service (224) that receives and processes messages and data received through the second network interface (col. 7, lines 11-23) wherein a message is comprising a message identifier (col. 10 lines 58-67 and col. 11 lines 1-14) from the remote computer comprising node (704) Fig. 7.

Boyd also shows receiving a memory location associated with the identifier to comprising sharing QP, CQ, and Memory TPT range between primary and alternate RNICs (col. 21 lines 20-67) where the alternate RNIC is transmitting the associated data

Art Unit: 2142

field to the memory location associated with the identifier in case of primary RNIC outage (col. 2, lines 59-61).

Boyd does not show searching the list of identifiers for the identifier, and, based on the result from the searching step, invalidating the identifier received from the remote computer if the list of identifiers does not include the identifier received from the remote computer.

Hilland shows searching the list of identifiers for the identifier comprising using a STag by RNIC Interface (RI) when handling RDMA operations to identify a memory location within a specific Memory Region (page 89 lines 42-48) wherein a memory region is associated with a Physical Buffer List through the STag (page 13 line 51). Hilland also shows invalidating an identifier comprising STag to prevent RNIC from accessing memory locations via the STag associated with that Memory Region (Page 112, lines 28-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Boyd by including the steps of searching the list of identifiers for the identifier and invalidating the identifier if the list of identifiers does not include the identifier in order identify the memory location associated with the identifier and de-allocate the identifier if it is associated with an invalid Memory Window (MW) (page 28 Fig. 3 in Hilland).

As to claims 2 and 9, Boyd in view of Hilland shows the identifier being invalidated by the operating system (Page 90, lines 8-12 in Hilland). It is inherent that the identifier is being invalidated by changing a validation field in RDMA header (622) as

Art Unit: 2142

showed in the RDMA protocol specification for the purpose of invalidating identifiers that are no longer useful (RDMA protocol specification, page 20, lines 32-41).

As to claims 3 and 10, Boyd in view of Hilland shows that invalidating STag identifier will prevent RNIC from accessing the memory location that STag is associated with (Page 112, lines 28-31 in Hilland).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Boyd by dropping or discarding the message data associated with the identifier (Fig. 6 in Boyd) if it cannot be successfully placed in the memory location due to invalidated identifier.

As to claim 11, Boyd shows a computer readable media comprising a memory location to be a random access memory (col. 35, line 3).

As to claim 12, Boyd shows a program component being a computer operating system (col. 7, lines 14-17).

As to claim 13, Boyd shows the first and second network interfaces operating under RDMA protocol (col. 2, lines 55-57).

As to claim 14, Boyd shows the first and second network interfaces operating under RDMA protocol over TCP/IP protocol (col. 2, lines 33-35).

As to claim 16, Boyd in view of Hilland shows instructions stored on a computer readable medium (col. 35, lines 1-5) performing the recited steps of claim 1, and further showing the additionally recited elements, as discussed regarding claim 2.

Art Unit: 2142

As to claim 17, Boyd in view of Hilland shows instructions stored on a computer readable medium (col. 35, lines 1-5) performing the recited steps of claim 16, and further showing the additionally recited elements, as discussed regarding claim 3.

As to claims 22-23, 25-28, Boyd in view of Hilland shows instructions stored on a computer readable medium (col. 35, lines 1-5) performing the recited steps of claim 8, and further showing the additionally recited elements, as discussed regarding claims 9, 11-14.

As to claim 24, Boyd in view of Hilland shows instructions stored on a computer readable medium (col. 35, lines 1-5) performing the recited steps of claim 22, and further showing the additionally recited elements, as discussed regarding claim 23.

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



Any inquiry concerning this communication or earlier communications from the examiner should be directed to Oleg Survillo whose telephone number is 571-272-9691. The examiner can normally be reached on M-Th 7:30am - 5:00pm; F 7:30am - 4:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on 571-272-3868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



ANDREW CALDWELL  
SUPERVISORY PATENT EXAMINER

Examiner: Oleg Survillo

Date: May 21, 2007

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